

(2) a study of the galls of *Celtis occidentalis*; (3) a comparative study of structures. The work is exceptionally well done and well presented. There are 17 known species of zooecidia on the *C. occidentalis*. The acarinous and lepidopterous galls are kataplasma in character, and the hemipterous and dipterous galls protoplasma in character. This latter type is more closely comparable to the normal plant parts, but the tissue forms are new. The author very properly suggests that zooecidology presents a unique field for the study of problems pertaining to the mechanism used in the expression of hereditary characters.—MEL. T. COOK.

Germination of rice.—NAGAI³¹ has made rather an extensive general study of the germination of rice, touching many points that have previously been worked out on other seeds. The cutinized inner integument of the ripe fruit is a semipermeable membrane. Such membranes have been found in the fruit walls of many grasses and in the coats of many seeds.³² Desiccated seeds of rice are not injured by steeping for 24 hours in ether, chloroform, absolute alcohol, acetone, and other substances. This is in accord with the work of BEQUEREL and of SHULL,³³ who have found that the dry coats of many seeds are impervious to such substances, but that, as the water content of the coats rises, they become more pervious. Rice germinates in an extremely low partial pressure of oxygen, yet the germination is abnormal, the hypocotyl growing only under considerable oxygen pressure. Acids and bases show no stimulative effects upon the germination of rice. A few hours of exposure to liquid air does not injure the seeds of rice or buckwheat. Two hours' exposure to 97–98° C. kills *Zea Mays*, but does little injury to rice, especially if it is desiccated.—WM. CROCKER.

Alkalies and salt absorption.—As a phase in the analysis of the effects of alkalies upon the development of plants, BREAZEALE³⁴ has studied the effect of NaCl, Na₂SO₄, and Na₂CO₃ upon the absorption of nitrates, phosphates, and potash by wheat seedlings. Up to 1000 ppm. in a nutrient solution they do not affect the absorption of nitrates. In this concentration NaCl does not modify phosphate absorption, but slightly depresses potash absorption. In 1000 ppm., Na₂SO₄ depresses the absorption of potash and phosphoric acid to approximately 70 per cent of that of the checks. In equal mol concentration Na₂CO₃ depresses the absorption of potash to 20 per cent and phosphoric acid to 30 per cent normal. With Na₂SO₃ these depressing effects were evident in 300 ppm. The writer thinks the depressing effect of the Na₂SO₄ is due to its

³¹ NAGAI, ISABURO, Some studies on the germination of seeds of *Oryza sativa*. Jour. Coll. Agric., Imperial University Tokyo 3:109–155. 1916.

³² BOT. GAZ. 56:169–199. 1913; 63:373–397. 1917.

³³ BOT. GAZ. 56:169–199. 1913.

³⁴ BREAZEALE, J. F., Effect of sodium salts in water cultures on the absorption of plant food by wheat seedlings. Jour. Agric. Research 7:407–416. 1916.